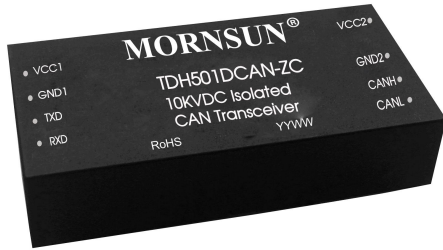


Single high-speed high isolation CAN isolation transceiver module

FEATURES

- Two-port isolation (10kVDC)
- Operating ambient temperature range: -40°C to +85°C
- High baud rate up to 1Mbps
- Complies with ISO 11898-2 standard
- Bus timeout protection
- The bus supports maximum 110 nodes
- Set isolation and ESD bus protection in one



RoHS

The TDH501DCAN-ZC series' main function is to convert TTL / CMOS level into isolated CAN bus differential level signals. The use of IC integrated technology allows for power isolation, signal isolation, CAN transceiver and bus protection all in one single CAN bus transceiver module, which withstands an isolation test voltage of 10kVDC. Also, they can easily be embedded in the user's end equipment, to achieve fully functional CAN bus network connectivity.

Selection Guide

Part No.	Power Supply Input 1(VDC)	Power Supply Input 2(VDC)	Baud rate (bps)	Isolation Voltage (VDC)	Bus Maximum Voltage (VDC)	Number of Nodes
TDH501DCAN-ZC	4.5-5.5	4.5-5.5	1M	10 k	±40	110

Limit Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec.max.)		-0.7	-	7	VDC
Pin Soldering Temperature	Soldering spot 1.5mm away from case, 10s max.	-	-	300	°C

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Power Supply Input Voltage	VCC1, VCC2	4.5	5	5.5	VDC
TXD Logic Level	High-level	V_{IH}	0.7VCC	Vcc	
	Low-level	V_{IL}	0	0.8	
RXD Logic Level	High-level	V_{OH}	VCC-0.4	4.8	
	Low-level	V_{OL}	-	0.2	0.4
TXD Drive Current	I_T	2	-	-	mA
RXD Output Current	I_R	-	-	10	
Serial Interface	Standard CAN controller interface for +3.3V/5V.				

Transmission Specifications

Item	Symbol	Min.	Typ.	Max.	Unit
Data Delay	TXD Transmitter Delay	t_T	-	55	ns
	RXD Receiver Delay	t_R	-	65	
	Cycle Delay	$t_{PRO(TXD-RXD)}$	-	120	250
Dominant Timeout	$t_{to(dom)TXD}$	0.3	1	12	ms

Output Specifications

Item	Symbol	Min.	Typ.	Max.	Unit	
Dominant Level (Logic 0)	CANH	$V_{(OD)CANH}$	2.75	3.5	4.5	VDC
	CANL	$V_{(OD)CANL}$	0.5	1.5	2.25	
Recessive Level (Logic 1)	CANH	$V_{(OR)CANH}$	2	2.5	3	
	CANL	$V_{(OR)CANL}$	2	2.5	3	
Difference Level	Dominant Level (Logic 0)	$V_{diff(d)}$	1.5	2	3	
	Recessive Level (Logic 1)	$V_{diff(r)}$	-0.05	0	0.05	
Bus Pin Maximum Withstand Voltage	V_x	-40	-	+40		

Bus Transient Voltage	V_{it}	-150	-	+100	
Bus Pin Leakage Current	($V_{CC}=0V, V_{CANH/L}=5V$)	-5	-	5	μA
Load Resistance Differential	R_L	50	60	65	Ω
Input Impedance Differential	R_{diff}	30	-	80	$k\Omega$
CAN Bus Interface	Meets ISO/DIS 11898 standard Twisted-pair output				

General Specifications

Item	Operating Conditions	Value
Isolation Test	Electric strength test for 1 min., leakage current <1mA	10kVDC Isolated at both ends (Input and output are isolated from each other)
Insulation Resistance	At 500VDC	1G Ω
Operating Temperature		-40°C to +85°C
Transportation and Storage Temperature		-50°C to +105°C
Operating Humidity	Non-condensing	10% - 90%
Case Temperature Rise	$T_a=25^\circ C$	25°C (Typ.)
Application Environment		The presence of dust, severe vibration, shock and corrosive gas may cause damage to the product

Mechanical Specifications

Case Material	Black flame-retardant heat-proof plastic (UL94 V-0)
Dimensions	51.50 x 26.50 x 12.00 mm
Weight	24g(Typ.)
Cooling Method	Free air convection

Application Precautions

1. Carefully read and follow the instructions before use; contact our technical support if you have any question;
2. Do not use the product in hazardous areas;
3. Use only DC power supply source for this product. 220V AC power supply is prohibited;
4. It is strictly forbidden to disassemble the product privately in order to avoid product failure or malfunction;
5. Hot-swap is not supported.

After-sales service

1. Factory inspection and quality control are strictly enforced before shipping any product; please contact your local representative or our technical support if you experience any abnormal operation or possible failure of the module;
2. The products have a 3-year warranty period, from the date of shipment. The product will be repaired or exchanged free of charge within the warranty period for any quality problem that occurs under normal use.

Applied circuit

Refer to the CAN Industrial Bus Interface Isolating Module Application Manual.

Design Reference

1. Typical application circuit

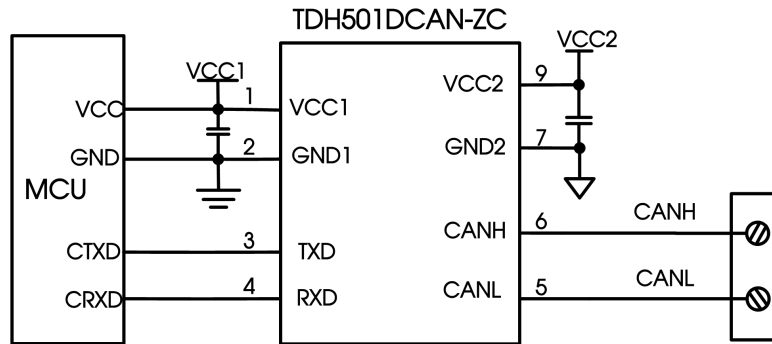


Fig.1

2. Recommended port protection circuit

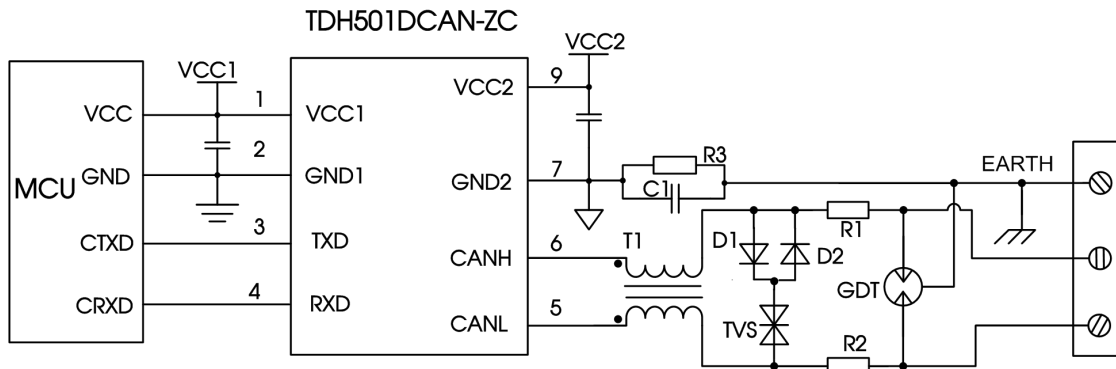


Fig.2

Note: Ground shield of twisted wire pair reliably.
Recommended components and values:

Component	Recommended part, value	Component	Recommended part, value
R3	1MΩ, 1206	R1, R2	2.7Ω /2W
C1	1nF, 2kV	D1, D2	1N4007
T1	ACM2520-301-2P	TVS	SMBJ15CA
GDT	B3D090L		

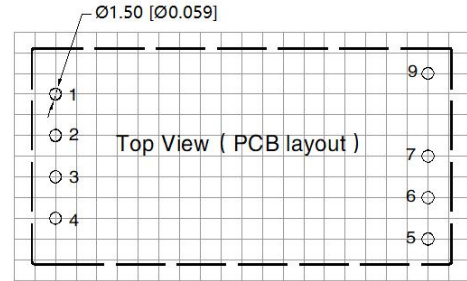
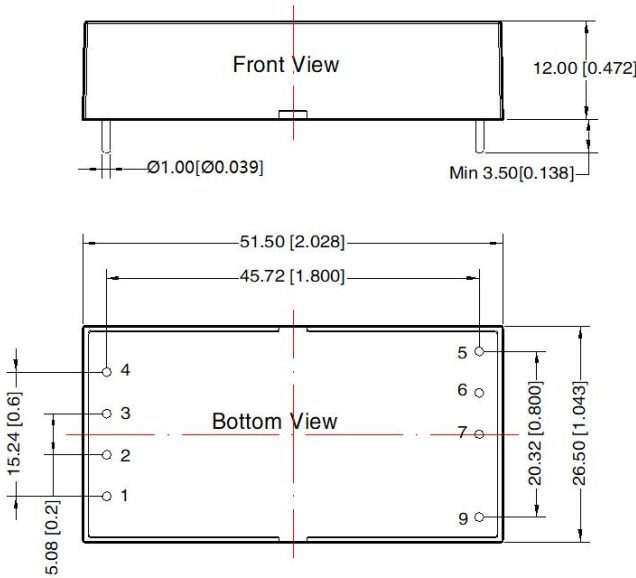
When the module is used in applications with harsh environment, it can be susceptible to large energy like lightning strike, etc. in which case, it is essential to add an adequate protection circuit to the CAN signal ports to protect the system from failure and maintain a reliable bus communication. Figure 2 provides a recommended protection circuit design for high-energy lightning surges, with a degree of protection related to the selected protection device. Parameter description lists a set of recommended circuit parameters, which can be adjusted according to the actual application situation. Also, when using the shielded cable, the reliable single-point grounding of the shield must be achieved.

Note: The recommended components and values is a general guideline only and must be verified for the actual user's application. We recommended using PTC's for R1 and R2 and to use fast recovery diodes for D1 and D2.

3. For additional information, please refer to our application note on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10 [± 0.004]
General tolerances: ± 0.50 [± 0.020]

Pin-Out		
Pin	Mark	Function
1	VCC1	Input Power Supply 1 Positive
2	GND1	Input Power Supply 1 Negative
3	TXD	Sending Pin
4	RXD	Receiving Pin
5	CANL	CANL Pin
6	CANH	CANH Pin
7	GND2	Input Power Supply 2 Positive
9	VCC2	Input Power Supply 2 Negative

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. The Packaging bag number: 58210039;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on company corporate standards;
- The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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